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DIAGNOSTIC SERVICES SECTION

FINAL REPORT

SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY (SCWDS)
COLLEGE OF VETERINARY MEDICINE
THE UNIVERSITY OF GEORGIA
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CASE NUMBER CC 246-03
DATE RECEIVED November 19, 2003
DATE OF REPORT *January 5, 2003*

STATE GA **COUNTY** Dawson **AREA** Amicalola Falls State Park

SPECIES (NO.) Red Tailed Hawk (1), Barn Owl (1) **SEX** F, M **AGE** Adult **WEIGHT** 1186 g, 466 g

CASE HISTORY: These two raptors were part of a group of educational birds at Amicalola Falls State Park. Both birds were long term residents. The red tailed hawk became lethargic on November 10, 2003. The bird was rehydrated and its appetite improved. Within three days, its appetite had again decreased. The bird was started on Baytril and seemed to improve but was found dead on November 16, 2003. On November 17, 2003, the barn owl was found lethargic with fluffed feathers. The bird was placed in a cage for transport and was found dead on arrival. A third bird (great horned owl) was observed to have green feces on November 18, 2003. The red tailed hawk and barn owl as well as a fecal sample from the great horned owl were submitted by Lauretta Dean of the Georgia Department of Natural Resources. The birds were delivered to SCWDS via overnight courier on November 19, 2003.

FINAL DIAGNOSIS: Rodenticide (brodifacoum) poisoning

COMMENTS: Rodenticide poisoning has been reported previously in many species of birds, including raptors. It is most often associated with ingestion of intoxicated rodents. Levels in these birds must be interpreted cautiously as they indicate previous exposure and not necessarily toxicosis, and these rodenticides are known to have a long half life in tissues. However, both birds, particularly the hawk, had evidence of hemorrhage which is typical of rodenticide poisoning.

WILD ANIMAL IMPLICATIONS: All animals are susceptible to rodenticide poisoning, although carnivores or omnivores are more likely to be affected than herbivores. Intoxication may occur due to direct ingestion of bait or by ingestion of other intoxicated animals.

PUBLIC HEALTH IMPLICATIONS: *Humans are also susceptible to rodenticide poisoning, although this is rare since it would be unlikely that a person would unknowingly ingest either baits or intoxicated animals.*

LIVESTOCK IMPLICATIONS: Livestock are susceptible to rodenticides, but intoxication is uncommon.

DIAGNOSTICIAN Angela Ellis, DVM **SUPERVISOR** William R. Davidson, PhD

DISTRIBUTION: SCWDS File, Holcomb, Holbrook, Harris, Frazier, Fletcher, Dean, Mastrota, Rattner, Converse, McLaughlin, Cooke, Bowers, Myers, Arza

Laboratory Results Begin on Page 2

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GROSS FINDINGS:
Red Tailed Hawk: This bird was in very good body condition. The left eye was very sunken compared to the right, and there was a small notch on the right side of the tip of the tongue which looked like an old injury. The skin was very hard to separate from the underlying muscle. The ventriculus was small and contracted and contained only a firmly packed ball of white fur. The crop was also empty except for a moderate amount of white fur. The duodenal mucosa was very mildly reddened. The intestinal contents were grey and fluid to pasty throughout the intestinal tract. There was no evidence of diarrhea around the vent. There was severe, multifocal to coalescing, bilateral calvarial hemorrhage. Gross lesions were not apparent in the heart, liver, lungs, kidneys, adrenals, thyroids, spleen, trachea, esophagus, ovaries, oviduct, or proventriculus.
Barn Owl: This bird was in good body condition. Greenish feces were noted on the posterior aspect of both hocks. There was also mild feather loss and breakage on the anterior aspect of both hocks with some pinpoint abrasions. The liver was normal in size but was very dark red to black. Focal hemorrhage was noted on the epicardium near the left atrium. There was moderate, petechial to ecchymotic, multifocal calvarial hemorrhage with meningeal hemorrhage over the cerebellum. Gross lesions are not apparent in the lungs, kidneys, spleen, adrenals, testicles, thyroids, esophagus, crop, trachea, proventriculus, or ventriculus.

MICROSCOPIC FINDINGS (W03-263A&B):
Red Tailed Hawk (W03-263A): Mild multifocal lymphocytic aggregates are noted within the renal interstitium. Within a section of heart, there is a single, small focus of lymphocytes within the interstitium. Within sections of lung, there are very mildly increased numbers of lymphocytes and plasma cells within the parenchyma. In a section of tongue, there is a focal area of ulceration. Within a section of crop, there are multifocal aggregates of lymphocytes and plasma cells in the submucosa. Mildly increased numbers of lymphocytes are scattered between glands in the proventriculus. No abnormalities are noted within liver, spleen, trachea, thymus, skeletal muscle, pancreas, ovary, adrenal, intestine, ventriculus, thyroid, or brain.
Barn Owl (W03-263B): Within a section of heart, there is moderate focal to multifocal hemorrhage. In sections of lung, there is severe multifocal hemorrhage. There is a single, small, heterophilic granuloma, and there are a few scattered lymphoid foci in the lung. In sections of liver, many hepatocytes contain clear, cytoplasmic vacuoles interpreted to be lipid. Within pancreas, there are numerous cystic areas lined by a single layer of flattened epithelium. These areas are filled with smooth, deeply eosinophilic material. No abnormalities are noted in skeletal muscle, testicle, spleen, thyroid, kidney, intestine, ventriculus, proventriculus, skin, or brain.

MORPHOLOGIC DIAGNOSIS:
1. Moderate to severe calvarial hemorrhage (Birds A&B)
2. Moderate focal myocardial hemorrhage (Bird B)
3. Mild multifocal lymphocytic interstitial nephritis (Bird A)
4. Mild focal lymphocytic myocarditis (Bird A)
5. Focal ulceration—tongue (Bird A)
6. Mild to moderate multifocal lymphocytic ingluvitis (Bird A)
7. Mild diffuse hepatic lipidosis (Bird B)

MICROBIOLOGIC RESULTS: Bacterial cultures were negative. Virus isolation from brain, heart, and cloacal swabs was negative.

PARASITOLOGIC RESULTS: Examination of the fecal sample from the great horned owl revealed a few miscellaneous eggs which could not be speciated. However, eggs were not present in large numbers.

TOXICOLOGIC RESULTS: Fresh tissues and ventricular contents were submitted to the University of Pennsylvania, New Bolton Center Laboratory of Toxicology, in Kennett Square, Pennsylvania, for heavy metal and organic chemical analysis. Brodificoum, a rodenticide, was detected in fresh tissues from both birds, although the hawk had a significantly higher level than the owl. Levels were 77part per billion (ppb) in the hawk and 7 ppb in the owl. The organic chemical screen performed is capable of detecting a large number of compounds including pesticides, strychnine, metaldehyde, a number of therapeutic and illicit drugs, euthanasia agents, and environmental contaminants.